UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/029,891	12/21/2001	Richard C. Willson III	2000-046CON2	5096

22905 7590 09/22/2004

SYMYX TECHNOLOGIES INC
LEGAL DEPARTMENT
3100 CENTRAL EXPRESS
SANTA CLARA, CA 95051

EXAMINER	
SODERQUIST, ARLEN	

ART UNIT	PAPER NUMBER
1743	

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/029,891	WILLSON, RICHARD C.	
	Examiner	Art Unit	
	Arlen Soderquist	1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 July 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25 and 27-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *3,14-17 and 21* is/are allowed.

6)☒ Claim(s) *1,2,4-13,18-20,22-25 and 27-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8-9-04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *See Continuation Sheet*.

Continuation of Attachment(s) 6). Other: page 2 of the IDS received 6-11-02.

1. The terminal disclaimer filed on November 19, 2003 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of US Patent 6,333,196 has been reviewed and is accepted. The terminal disclaimer has been recorded.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1, 4-13, 18-20, 22-25, 27-30 and 2 as it depends from claim 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlson in view of Gimzewski, Johnson (Analytical Calorimetry), Kulkova, Schödel (DD 234942 translation attached to office action mailed February 10, 2004) or Temkin. In the paper Carlson presents apparatus and a microactivity test for measuring low temperature activity of automobile exhaust catalysts. In the first paragraph of page 467, a need is taught for rapid screening tests and in particular "tests that will measure low temperature activity" to reduce the amount of costly testing required for catalyst research and development. In the second paragraph of the same page, differential thermal analysis (DTA) was taught as a suitable tool for measuring low temperature catalytic activity. Added benefits include the ability to rate a catalyst directly against other catalysts and the use of small samples. In the fourth paragraph of page 467, the aim of the research presented in the paper is taught as developing a rapid sensitive test giving data that can be interpreted relative to the performance of known and evaluated catalysts. A micro-activity test is described in which differential thermal analysis is used to evaluate rapidly the ability of an auto exhaust catalyst to initiate and sustain combustion of a synthetic exhaust mixture. The study shows the flexibility of the test in that it

provides direct comparison of experimental catalysts with inert standards, standard catalysts, or other experimental catalysts. Data are presented that demonstrate the capabilities of the test, the limitations of the test, and the hazards of over-interpretation of test results. Figure 1 shows the DTA microactivity flow apparatus used including thermocouples. In the first two paragraphs under the "RESULTS AND DISCUSSION" heading on page 468, Carlson discusses two problems that were encountered in the development of the test. These included catalytic activity of the thermocouple and heat loss through heat conduction. Also taught is that these problems were solved: the first by changing the thermocouple material to one with no catalytic effect and the second by using small sample sizes to reduce the heat produced since the problem was found to be sensitive to sample size. The last paragraph of page 468 gives the two criteria of low temperature activity used to compare or rate the catalysts. The criteria used were the temperature that the exotherm appears and the rate of temperature rise to the exotherm maximum. The use of the temperature that the exotherm maximum is observed should be used in conjunction with the initiating or "light-off" temperatures since both low "light-off" temperatures and rapid heat evolution or rate of conversion are necessary for good low temperature catalytic activity. The test reproducibility was demonstrated and found to be more than adequate for catalyst screening purposes (see page 469). Table 3 with its associated discussion and figures explains how the rating or comparison would happen. This table and the paragraphs above and below it on page 469 show the wide spectrum of catalysts that have been tested along with the high degree of sensitivity that can be built into the test. Figures 10-11 and their related discussion teach a possible thermal stability test. Figure 9 and its discussion show the use of a known catalyst as a reference in the method and device. Carlson does not teach simultaneous measurement of a plurality of catalyst candidates at a plurality of sites on a common support.

In the paper, Gimzewski teaches a multi-sample high-pressure DTA for measuring oxidation induction times. The design and operation are described of a DTA instrument which can run five samples simultaneously to measure their oxidation induction times in oxygen or air at pressures up to 70 bar and isothermal temperatures up to 250°. Although designed for high-productivity testing of automotive lubricants, the instrument is applicable to other materials such as greases, edible oils and polymers. The third to fifth paragraphs of page 98 discuss the multi-sample concept and its use in the described DTA device because of the considerable demand for

DTA testing in the petroleum industry. The described device is a batch reactor (see page 101, "static atmosphere" under the "Gas flow arrangement" heading. The conclusion (page 105) teaches that the device has produced substantial improvements in accuracy and productivity and points to an expectation of similar improvements with other materials.

In the paper Johnson teaches multiple sample differential scanning calorimetry with a new multiple sample differential scanning calorimeter (DSC) system, incorporating a microprocessor-based data system. It can perform measurements on three samples in a single furnace simultaneously in the time usually required to do one. Page 133 lists four limitations with known DTA apparatus that are overcome in the described apparatus. Because all samples experience the same thermal history, more dependable intercomparisons of samples may be made by including reference or quality control materials and calibration standards. Also see page 139 for a listing of six advantages of the multi-sample system. The data system provides teletype control of all aspects of the experiment except the furnace program; it stores the data, makes identification labels, and draws the DSC curves. The system comprises a multiple sample, single reference DSC cell, a data system, a furnace-controller and a recorder as shown in figures 1-2 and 5. The design and performance of the system are described.

In the paper Kulkova presents apparatus for testing catalysts for the oxidation of ethylene to ethylene oxide. A tubular reactor for the simultaneous testing of ≤ 5 catalyst samples (5 cc. each) under isothermal conditions is described. In the oxidation of C_2H_4 at 220-320°, a Ag catalyst with Se promoter was used for ≤ 2800 hours with good results, the catalyst productivity being between 115 and 330 g./l. hour. The reaction products were analyzed by gas chromatography in a 200-mm. column, with polyethylene glycol sebacate supported on Celite-545. Pages 2-4 of the translation describe the apparatus including the presence of thermocouples (paragraph bridging pages 2-3).

In the published application Schödel teaches method and process for determination of catalyst activity. Catalyst activity is routinely, rapidly, and accurately monitored in a sampling-testing system in which 3-5 samples, containing 0.05-2 g catalyst each, are heated separately and simultaneously in a radiation oven, separate 2-30 L/h gas flows (containing reactants and withdrawing products) are passed through the samples, and the products are withdrawn and separately injected for analysis; each sample has a separate

temperature-measuring element and the temperature of each sample can be independently controlled and monitored by a rotating dial. Thus, 3 samples (containing 200 mg each) of a Pt/Al_2O_3 alkane reforming catalyst were reduced in hydrogen and tested for reforming of heptane (at 1.15 g/g catalyst-h flow); the 3 samples had heptane conversions and yields of aromatic hydrocarbons of 46.4 ± 0.7 and 22.9 ± 0.4, 28.7 ± 0.9 and 12.4 ± 0.2, and 36.9 ±0.8 and 23.5 ± 0.4 mol%.

In the abstract Temkin presents an ideal-displacement laboratory reactor. A laboratory reactor is described having a set of small diameter tubes. Catalyst granules or pellets are placed into the tubes, diluted with an inert material, and the catalytic activity for a heterogeneous reaction can be investigated simultaneously for several catalysts, depending on the number of tubes present. The wall of the tubes are equipped with thermocouples. Isothermal conditions are obtained by passing the gas through the system; the catalyst acquires the temperature of the tube walls.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Carlson device to be able to run multiple samples simultaneously as taught by Gimzewski, Johnson, Kulkova, Schödel or Temkin because of the advantages of multi-sample processing as taught by Gimzewski, Johnson, Kulkova, Schödel and Temkin.

4. Claims 3,14-17 and 21 are allowed.

5. Examiner in sending a copy of page 2 of the IDS received June 11, 2002 because one of the references was not initialed.

6. Applicant's arguments filed July 7, 2004 have been fully considered but they are not persuasive. With respect to the Carlson reference examiner agree that it does not anticipate or obviate the instant claims by itself, however examiner maintains that the claims are obvious in view of the cited combination of references. Relative to some of the specific comments, examiner responds as follows. Relative to the problems of catalytic activity of the thermocouple and the heat conduction, examiner points out that both problems were solved as explained on page 469. A change to a thermocouple material that had no observable catalytic effect solved the problem of the thermocouple having catalytic activity. Using a small sample size solved the heat conduction problem since the effect was shown to be sensitive to sample size. Thus Carlson solved both problems to the point that they felt they were able to obtain useful information. This

disclosure would have given an expectation that similar problems would be solvable with other systems since Carlson used the test with a wide spectrum of catalysts as explained on page 469. Additionally, it appears that applicant is arguing that in a species-genus situation, teachings that would anticipate or obviate a species would not anticipate or obviate a claim to a genus. Examiner believes that while this argument is germane to the instant situation, the Courts have consistently decided that anticipation of a species within a genus does anticipate a claim to the genus (see MPEP 2131.02). In the same manner, a combination of references that obviates a species within a genus would also obviate a claim to the genus. In this way the solutions of Carlson are within the scope of applicants' generally universal screening device (genus). Relative to the "common support" language, examiner points out that applicant teaches a variety of formats for the common support including a plate with wells or a block of material with a plurality of channels or holes therethrough (the monolith). Thus a variety of formats could be considered to be within the common support language. Relative to the combination of the references examiner points out that in the third paragraph of the introduction Carlson teaches that differential thermal analysis is a well developed and widely used analytical tool having primarily been used to study the thermal characteristics of catalyst materials. Thus the test which Carlson developed was developed using knowledge of differential thermal analysis based on the traditional use of DTA in investigating the thermal characteristics of materials. This traditional use of DTA is the same use as that of Gimzewski and Johnson. Therefore these references are analogous art and would have shown the benefit of using a multisample technique in terms of time, effort and cost. The additionally applied references also clearly show that there is a similar benefit obtained through simultaneous testing of a plurality of catalyst samples. Additionally, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981) or *In re Sneed*, 218 USPQ 385, 389 (Fed. Cir. 1983).

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arlen Soderquist whose current telephone number is (571) 272-1265 as a result of the examiner moving to the new USPTO location. The examiner's schedule is variable between the hours of about 5:30 AM to about 5:00 PM on Monday through Thursday and alternate Fridays.

A general phone number for the organization to which this application is assigned is (571) 272-1700. The fax phone number to file official papers for this application or proceeding is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Arlen Soderquist

September 21, 2004
ARLEN SODERQUIST
PRIMARY EXAMINER